

METER LAB.

INTEGRATING DIGITAL MICROVOLTMETER

WITH TRANSDUCER
CONDITIONING FOR
PHYSICAL AND
SCIENTIFIC
MEASUREMENT



MP MASTER



MA27767

OWNER'S MANUAL
Calibration Prod.

7.329

16.

TEMPORARY

CALIBRATION PROCEDURE

DIGITAL THERMOCOUPLE THERMOMETER

DORIC MODEL DS-100-T3

(FINAL INSTRUCTION MANUAL IN PREPARATION)

SECTION 4

CALIBRATION

4-1. WARM-UP

The DS-100-T3 Thermocouple Thermometer should be allowed to warm up for one hour prior to calibration. After warm-up the plug-in latch is released. This causes the unit to slide out about 1-½ inches giving access to the calibration controls. The plug-in should not be left extended except while actually adjusting the controls since the air circulation upsets the internal thermal balance.

4-2. EQUIPMENT

A DC voltage calibrator is required capable of supplying accurate voltages up to 100 millivolts, with better than 1 microvolt resolution and stability. Low output impedance DVM calibrators are not good enough as their noise is typically 10-50 microvolts. Generally the only suitable equipment is a low-thermal microvolt pot such as Honeywell 2768 or 2773, or a .005% type DVM calibrator in conjunction with a ratio set such as ESI 1063B.

4-3. CALIBRATION PROCEDURE

4-3-1.

Allow the instrument to warm-up prior to calibration. Adjust the sample rate control for the desired repetition rate.

4-3-2.

If the meter is a dual curve unit (DS-100-T3-D), the following steps are required:

- (a) Depress the 100 mv range button.
- (b) Short the input terminals (+Cu, -Cu, Guard), using a copper buss wire.

- (c) Open the plug-in and adjust the μ volt offset control for a display of + 00.00 mv.
- (d) Depress the left-hand (X channel) pushbutton.
- (e) Adjust the X 32⁰ OFFSET pot to obtain the reading indicated on the calibration sticker attached to top front of the T-3 plug-in.
- (f) Depress the middle (Y channel) pushbutton.
- (g) Adjust the Y 32⁰ OFFSET pot to obtain the reading indicated on the calibration sticker.
- (h) Depress the left (X channel) pushbutton.
- (i) Remove short from the +Cu, -Cu inputs. Apply a DC calibrator to the +Cu, -Cu inputs. Keep the guard shorted to -Cu. Dial the larger input voltage indicated on the calibration sticker for the X channel.
- (j) Adjust the indicated X channel pot till the indicated temperature reading is obtained.
- (k) Depress the middle (Y channel) pushbutton.
- (l) Apply the larger indicated voltage for the Y channel.
- (m) Adjust the indicated (Y channel) pot till the indicated temperature reading is obtained.
- (n) Depress the 100 mv pushbutton.
- (o) Apply +100.00 mv to the +Cu, -Cu inputs.
- (p) Adjust the 100 mv pot until a reading of +100.00 mv is obtained.
- (q) Close the instrument and recheck calibration after warm-up.

4-3-3.

If the meter is a single range DS-100-T3, follow steps (b), (g), (l), and (m) in that order.

$$\begin{array}{rcl}
 \text{Cal.} & + 7.329 \text{ MV} & = 800.1^{\circ} \\
 & + 16.716 \text{ " } & = 1600.0^{\circ}
 \end{array}$$



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4-4. COLD JUNCTION COMPENSATOR

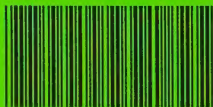
For instruments equipped with the internal reference junction compensator, it may be desirable to check the compensator's ice-point accuracy.

4-4-1.

Connect your thermocouple to the rear thermocouple input connectors. Place the sensor in a stable ice bath with accuracy better than the thermometers' resolution, for example, ice bath should be accurate to 50 millidegrees F if thermometer has 100 millidegrees resolution.

Readout should be within $\pm 0.25^{\circ}\text{F}$ of reading printed on calibration sticker, assuming calibration is done within ambient reference conditions of $77^{\circ}\text{F} \pm 2^{\circ}\text{F}$. Do not make any adjustments.

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